

Responding to the Crisis of Human Creativity in the Age of Machine Creation

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ABSTRACT

Focusing on the topic of human creativity in the age of machines, this paper explores the characteristics, manifestations, and impacts of human social production and creative activities in the age of machines. It also investigates ways to enhance creativity to adapt to and improve social development, in response to the current concern about the crisis of human creativity.

KEYWORDS

Machine creation; Human creativity; Creativity crisis; Contemporary innovation; Social development

1 Introduction

1.1 Research background

1.1.1 The significance of human creativity

Creativity refers to creativity, ingenuity, and the ability to create new or original things and make them useful or usable. The most important aspects of creativity are originality and effectiveness (Mark & Garrett, 2012). For a long time, "creativity" has been viewed as a uniquely human ability, enabling humans to independently create new things and continuously drive social progress.

1.1.2 The development of creativity in the age of machine creativity

Since the Industrial Revolution of the 18th century, and especially since the Second Technological Revolution, with the advancement of science and technology, the role of scientific knowledge has continuously increased, with science outpacing technology (Ju & Xing, 2004). The application of scientific knowledge to guide and drive technological development is a hallmark of creativity in the machine age. Both the mutual support and conflict between human and machine creativity are prominent. Since the internet era, scientific and technological development has accelerated rapidly, ushering in an era of digitalization and intelligence. Big data algorithm systems are widely used in social life, and the development of generative AI has made it easier for people to access knowledge and information. The development of artificial intelligence has generated new productive forces, significantly increasing the level of social automation. Human creativity has ushered in new opportunities but also faces new challenges.

1.2 Research questions

- What characteristics does human creativity exhibit in the age of machine creation?
- What creativity crises exist in the age of machine creation?
- What are the current impacts of the creativity crisis?
- How can we promote reforms to maintain and develop creativity?

1.3 Research significance

Academically: To enrich the breadth and depth of theoretical research on creativity, with a focus on deepening understanding of machine creation.

Practically: To provide reference solutions for education, social life, and cultural institutions.

2 The historical evolution of creativity in the machine age (concept & evolution)

2.1 Industrial revolution

Since the Industrial Revolution, humanity has created the most magnificent material wealth in history. From its inception to the present day, the Industrial Revolution has involved an increasing number of countries and regions. No other event or economic and social phenomenon in human history can compare in significance to the Industrial

Revolution (Jin, 2015). The invention and use of machines has greatly improved production efficiency. Especially since the advent and widespread use of the steam engine, humanity has gradually entered an era of large-scale machine creation. Industrial production has become the primary mode of social production, and society has undergone profound changes. The intersection of human creativity as the primary driver and machine creativity as an auxiliary tool has become increasingly prominent. Since the beginning of the second technological revolution, the world has experienced multiple stages of upgrading production tools and shifting productivity. Now, in the digital age, automation has reached a historic high. Machines initially served as auxiliary creative tools, but now, thanks to the development of algorithms and programming systems, they have acquired the ability to actively create.

2.2 Modern human creativity

Since the beginning of modern world history, human society has undergone tremendous changes. With the West as the core, both natural science and social science have achieved tremendous breakthroughs. Numerous scientific phenomena have been discovered and explained. The emergence of natural science theories such as Einstein's theory of relativity and Newton's theory of universal gravitation has transformed humanity's understanding of the natural world. Machine production has led to massive capital accumulation, and theories such as the Enlightenment have influenced ideology, leading many Western countries to establish capitalist social systems and production relations. The development of science has led to a growing emphasis on and support for the concept of "humanism" as the primary driver, valuing and developing human initiative, and actively transforming the world as a common understanding. 2.3 The Digital Age: Digital creativity emerged with the rise and application of digital technology in various fields. Traditional creativity involves innovation using non-digital means, while in the digital age, the creative subjects are people who can master digital media (GU & HAN, 2017). From the application of network systems in various areas of social life to the widespread application of Internet of Things technology in the 5G era and the impact of artificial intelligence on daily life and production, information automation has developed rapidly in this century. The interconnectedness of all things has transformed information exchange and facilitated daily life. Human creativity has developed to a stage where it is "reacting upon creation." With the rapid development and abundance of material resources, how to integrate this with machine creation while maintaining the unique creativity of human nature is a topic of intense social discussion and academic attention.

3 The crisis of creativity in the AI era

3.1 The crisis of human originality

We are now entering the digital age. AI can actively engage in creative activities, encompassing a wide range of fields, including scientific inventions, industrial production, and literary creation. However, generative AI tools also hinder people's active creativity in real life. After the emergence of ChatGPT in 2023, the use and discussion of generative AI has encompassed various fields and levels. For example, Charlie Brooker, the creator of *Black Mirror*, attempted to use ChatGPT to generate episode content in 2023. "The first thing I did was type 'generate *Black Mirror* episodes,' and it came up with something that, at first glance, read reasonably. But then, it was completely bullshit. Because all it did was look up all the synopses for *Black Mirror* episodes and mash them together (Owen, 2023)." The AI only provided reference material for the topic. He believes that AI-generated content doesn't actually contain any original ideas. "Forget deepfakes—it's thoughtful and uninspired (Owen, 2023)." He believes that the plot content still relies on the original ideas of the crew.

Similar incidents and discussions have been common in recent years. Creatives and innovators in various fields have discussed generative AI creation, with both similar and divergent perspectives. AI creation is a new mode of production in the machine age. With widespread adoption, how to preserve and leverage human creative capabilities and establish a connection with AI are crucial for the future.

3.2 The crisis of machine subjectivity and human subjectivity

The boundary between human creative subjectivity and machine generation is increasingly blurred. Recently, Hangzhou held a public trial and pronounced a verdict in a case involving copyright infringement and unfair competition using generative AI. In this case, Company A, the operator of a social e-commerce platform, generated and accumulated a large amount of high-quality "grain-planting" content by attracting platform users and high-quality creators to share their personal consumption experiences and lifestyles. Companies B and C provided copywriting for these content through AI writing tools, while Company D provided download services. Company A believed that the provision of "grain-planting" content generation services by Companies B and C undermined Company A's competitive advantage and commercial interests. (Hangzhou Intermediate People's Daily Online) People's Court, 2025). Company A also argued that the actions of

the three companies infringed the copyright of Company A's content. Ultimately, the court ruled that Company A's complaint against the three companies for "unfair competition" was valid, but its copyright claim was dismissed.

This case reflects the potential impact of AI-generated creation on human subjectivity. If intellectual property and copyright issues are not carefully addressed, humans, as thinking subjects, may be impacted by the rapid pace of machine production. In actual social production activities, the substantive interests of both parties involved may be harmed. This directly highlights the fact that the contradiction between human subjectivity and machine subjectivity is particularly pronounced in the AI era. How humans can maintain their creative abilities while not infringing on the legitimate rights of others depends on the division of labor established with machine production.

3.3 Compressed social diversity

The diversity of social creativity is also limited in the era of machine creation.

In the field of science and technology, social vitality is impacted by the monopoly of large-scale capital. The market is often dominated by large corporate platforms, which monopolizes wealth and technology. This is a major factor affecting the widespread creativity. Large creative companies and platforms virtually control creative tools and dissemination channels, which limits the space for emerging and small and medium-sized enterprises to operate.

For example, in the mobile software sector, Apple uses platform rules to As the sole mobile application distribution platform for iOS devices (mobile smart terminals running the iOS system), the App Store controls virtually all download channels for Apple users, becoming virtually the only way for Apple users to download apps (CNN, 2024). This is a result of Apple's behind-the-scenes monopoly on this market channel. While Google supports hardware manufacturers in choosing different mobile application distribution platforms, its agreements with hardware manufacturers, such as pre-installation on mobile smart terminals, have also made Google Play the dominant mobile application distribution platform for Android devices (Luo, 2024). Other related manufacturers have been affected by the monopoly, experiencing a significant reduction in market share and a consequent decrease in innovation.

In recent years, laws and regulations have been enacted and reforms have been implemented around the world. For example, the US government began investigating Apple's monopoly issues in 2016. The Chinese government revised its Anti-Monopoly Law in 2022, emphasizing that operators with a dominant market position may not abuse their dominant position by exploiting platform rules (Luo, 2024).

4 Impact of the creativity crisis

4.1 Technological optimism optimism

Core concept: Technology is a tool that liberates human creativity and expands the boundaries of expression. It emphasizes that technological media not only carry content but also have a shaping impact on society.

Analysis:

In his 1964 book, McLuhan argued, "In the mechanical age, the Western world extended the body into space. Now, after more than a century of electrical technology, the central nervous system has been extended globally. We are approaching the final stage of human extension—the technology of consciousness, when creative cognitive processes will be extended to the entire human society" (McLuhan, 1964). He proposed that "media is an extension of human consciousness" and "the medium is the message," emphasizing that while media superficially serves as a vehicle for transmitting information, it is essentially the expression of human self-awareness through technology.

The school of thought centered around McLuhan is optimistic about technological development. They emphasize that technology is a tool that assists human creativity, and that humans themselves, through technology, develop creativity, achieving the goals of liberating thought and promoting social progress. This perspective continues to influence people's attitudes toward the development of science and technology, both historically and today, and serves as a methodology for studying the positive impact of machine creation on human creativity.

For example:

Generative AI tools are now playing a crucial role in people's daily lives and work. When people engage in various work and daily activities, such as writing articles, planning projects, and performing quantitative calculations, ChatGPT Generative AI tools like DeepSeek can help people generate text outlines, assess the feasibility of planning proposals, and estimate the accuracy of measurements. They significantly improve work and personal efficiency, while also enhancing people's quality of life. This is the rationale behind the technological optimism that machines have a positive impact on human creativity.

Influence:

A key perspective of technological optimism is that technological progress lowers the threshold for human creativity, thereby inspiring more people to participate in various creative fields, such as technological innovation and artistic

expression, thereby expanding the creative ecosystem, promoting social vitality, and ultimately advancing human creativity.

4.2 Technological criticism

Core principle: Industrial society may alienate humans, weaken their creative subjectivity, and lead to cultural homogenization.

Representative Schools: Adorno and Horkheimer of the Frankfurt School. *The Dialectic of Enlightenment*, published in 1947, criticized the "culture industry" phenomenon resulting from the industrialization of mass culture, arguing that the commodification of culture leads individuals to passive acceptance and a gradual loss of active critical consciousness.

Analysis: "What we are attempting is simply to explain why humanity has not entered a truly human state but has instead sunk into a new state of barbarism" (Adorno & Horkheimer, 1947). The most significant significance of this work lies in its tendency to undermine the established intellectual standards of the West following the modern Enlightenment. It argues that the emergence of nationalist terror was not merely an aberration during World War II but was rooted in the very understanding of Western civilization. The chapter "The Culture Industry: Enlightenment as Mass Deception" points out the serious problem of cultural homogeneity in industrial society, while standardization and mass production compromise the boundaries between work and life. The authors attribute these negative phenomena to the role of technology in the economy, rather than to the laws of technology itself (Adorno & Horkheimer, 1947).

Case study: This year, a band called Velvet Sundown was featured on Spotify. The monthly listenership of a song on [the platform] surpassed one million. Its introduction included two albums, some gauzy cover art, and a genre-appropriate backstory. The music was credible, the branding was effective, and the results were convincing. Only later did the truth emerge: there was no such band. Every note, lyric, image, and gesture was the work of generative AI (Fessel, 2025).

This case reflects that while technological development has achieved the "replication of human creativity," the technology itself lacks human emotional awareness. This is a characteristic of the industrial machine age: people can profit from and create results through technology. However, without independent thinking, autonomous consciousness cannot be fully realized, thus weakening human creativity.

Influence: Critical Technological Theory criticizes the "culture industry" under the absolute power of capital, arguing that technology, under industrial capital, has become a tool serving the ruling power of capital. Its core objective is to encourage people to examine how to construct the legitimate value of technology in socioeconomic relations, and to guard against the abuse of technology by capital power, which could undermine people's freedom to participate in creation. This theory has important implications for improving the relationship between technology and the socioeconomic system.

5 Innovation solutions (strategies & reconstruction)

5.1 Education system innovation

Currently, countries around the world are encouraging the integration of AI into their education systems and cultivating students' comprehensive abilities and literacy in interdisciplinary thinking.

5.1.1 Empowering subject education with AI

On May 15th, at the "Artificial Intelligence Empowering STEM Education" conference held at the 2025 World Digital Education Conference in Wuhan, Chinese and international experts, scholars, and education administrators discussed the current state of AI applications and future development prospects in STEM-related subject education (China Education News, 2025). Zheng Qinghua stated that STEM disciplines offer fundamental methods for understanding, describing, and transforming the world. "In the intelligent era, addressing social issues such as AI algorithm bias, intellectual property rights, privacy breaches, and information cocoons requires talent with STEM theoretical and technical backgrounds (Zheng, 2025)." This implies that STEM research can provide interdisciplinary support in the social sciences. This demonstrates the importance of AI in improving information flow and break down disciplinary barriers. It also provides guidance for the transformation of disciplinary education systems.

Promoting the mutual learning and integration of AI technology with diverse fields such as art design and engineering computing can provide a development direction for comprehensive innovation. Case studies are already available around the world, such as the aforementioned "STEAM + AI" development direction, which attempts to break down disciplinary barriers, integrating existing disciplines with AI to achieve innovation and creativity.

5.1.2 Critical thinking training

"Cultivate students' disciplinary and even interdisciplinary literacy to support complex problem-solving, scientific literacy and creativity to support creative task-solving, and develop new digital literacy centered on human-computer collaborative thinking, as well as critical thinking that enables them to maintain rational thinking and discern truth from falsehood and quality from inferiority when faced with AI technologies and products (Wang & Zhou, 2024)." At the "AI Empowers STEM Education" conference, Director Feng Xiaoying of Beijing Normal University emphasized that achieving the vision of human-computer collaboration requires enhancing students' understanding of AI. Furthermore, students must maintain a rational attitude toward AI technologies and related products, which means possessing the ability to think critically and discern. The education system needs to cultivate students' ability to distinguish between machine-generated and human-original creations, enabling them to discern the positive and negative value of AI's thinking in the overall creative process. Students should be able to flexibly use AI in various fields to complete creative activities while maintaining independent thinking, possessing the willingness and ability to actively participate in creation, and forming a positive interaction with AI.

5.2 Human-computer collaboration model (integrating uses and gratifications theory)

Analyzing human-computer collaboration based on the concepts of uses and gratifications theory, the key to achieving a positive human-computer collaboration model lies in establishing the concept of "human-computer co-creation" rather than "machine replacement" and developing reasonable practical methods for human-computer co-creation, emphasizing that AI is a creative enabler rather than a replacement.

Case study and analysis:

Berlin-based electronic musician Holly Herndon's third album, "PROTO," integrates her own voice with AI creation. The album's music includes not only her own voice but also the voice of "Spawn," a "new machine intelligence" running on a modified gaming computer, forming an AI choir. Spawn was co-created with AI expert Jules LaPlace and trained in audio processing. Herndon, who uses her pronouns to refer to Spawn, believes that AI in music is not just a tool but also an ensemble member (Geffen, 2019).

This case demonstrates that if people consciously and actively participate in creation, they can overcome the "instrumental effect" of AI tools when using them, allowing AI to actively empower creative activities, resulting in works that combine the warmth of humanity with the convenience of technological innovation.

5.3 Cultural and institutional development (copyright and norms from Chinese and western perspectives)

Emphasize originality and ethical institutional norms: Cultural support for creative endeavors. Encourage original creation, establish systems to protect the rights of creators, and ensure fair and transparent use of AI.

Western case: Western societies are relatively more concerned with the realization of individual rights. During the 2023 Writers' Strike, the Writers Guild of America (WGA) placed the issue of generative AI in television and film writing at the heart of negotiations. Like other industries, WGA members face the existential question of how this evolving new technology will impact their careers (Intelligence, 2023). Their terms explicitly demanded that "AI should not replace screenwriters," prohibiting production companies from using AI to replace human production. Ultimately, their request led to the inclusion of protective clauses in the new contract, explicitly stipulating that AI cannot "write or rewrite texts independently" and prohibiting the use of existing film and television works to train AI.

Chinese perspective: Chinese society relatively emphasizes the realization of collective social values. "Cultural innovation, in a practical sense, manifests itself as the progress of social development, with people's values, mindsets, abilities, qualities, and mental outlook keeping pace with the times, thereby constantly adapting to the demands of new social development. The focus of Chinese cultural innovation is on overcoming the limitations of its own culture and achieving a transition from old cultural forms to new ones (Wang, 2015)." Some Chinese scholars have proposed measures to "focus on promoting the healthy development of the new generation of artificial intelligence," arguing that "enhancing originality" should be a key path. "Focus on key core technologies, adhere to a problem-oriented approach, enhance scientific and technological innovation capabilities, and ensure that key core technologies in artificial intelligence are firmly in our own hands (Wang, 2025)." At the national level, emphasis is placed on strengthening the cultivation of originality and striving to achieve transformative and disruptive breakthroughs in the development direction, theories, methods, tools, and systems of artificial intelligence (Wang, 2025). The Chinese government is currently working to enhance industrial innovation capabilities while improving the synergy between technology and social development, integrating innovation with social value.

6 Conclusion

Creativity is the driving force behind social progress and the evolution of civilization. In the age of machine creation, the large-scale creative capabilities of machines have transformed the way humans create. Against the backdrop of a global surge in automation, the development of artificial intelligence has pushed the connection between human and machine creation to a new stage. On the one hand, this has increased the efficiency of human information acquisition, content generation, and creativity, lowering the barrier to participation and inspiring more people to participate in creation. On the other hand, this has presented social challenges such as weakened originality, weakened subjectivity, and a reduction in the diversity of social creativity. Research indicates that the contemporary crisis of creativity facing humanity manifests itself in the decline of original content and the exacerbation of cultural homogeneity caused by AI creation; the control of dissemination channels by market platforms and algorithmic logic, which weakens creative agency; and the high concentration of capital and technology, which tilts innovation resources towards a few large companies and platforms, which diminishes the diversity of social creativity. However, crises also breed opportunities. As McLuhan proposed, "a medium is an extension of consciousness." The rapid development of technology should not be hastily interpreted as a replacement for humans, but rather as an extension of human creativity. Establishing a partnership with artificial intelligence would be highly beneficial.

Addressing the creativity crisis requires a multi-pronged approach: At the educational level, efforts should focus on cultivating students' critical thinking and comprehensive literacy, helping them learn to dialectically view machine-generated content and human originality, and maintaining their reflective capacity. In terms of technological governance, antitrust measures and other measures should be implemented to establish and strengthen copyright and ethical standards, prevent resource misuse, and protect the independence of creators. At the cultural level, a balance should be sought across Eastern and Western contexts to maintain social diversity and inclusion.

In summary, human creativity faces both crises and opportunities in the age of machine creation. The development of artificial intelligence does not signal a decline in human creativity. On the contrary, it can become a significant force driving a transformation in the way humans create. The future direction of creativity depends on coordinated reforms across multiple dimensions, including education, governance, and culture. To safeguard the independence and originality of human subjectivity, we must leverage technology to empower and promote the continued flourishing of creativity in the new era.

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